



<b>Sample assessment task</b>	
<b>Year level</b>	8
<b>Learning area</b>	Technologies
<b>Subject</b>	Design and Technologies: Materials and technologies specialisations
<b>Title of task</b>	Model spaceship
<b>Task details</b>	
<b>Description of task</b>	Students are required to develop a design solution while investigating timbers, metals and acrylic materials. Students design and construct a model spaceship on a metal stand, using materials available in a studio or workshop.
<b>Type of assessment</b>	Formative
<b>Purpose of assessment</b>	Develop students' understandings of the design process and how products are created and have evolved for consumers.
<b>Assessment strategy</b>	Stages of design folio development or worksheet completion and to complete the project within a suitable time frame.
<b>Evidence to be collected</b>	<ul style="list-style-type: none"> <li>The design folio or series of worksheets</li> <li>Completed product and evaluation sheet</li> </ul>
<b>Suggested time</b>	One term, approximately 8 weeks
<b>Content description</b>	
<b>Content from the Western Australian Curriculum</b>	<p><b><i>Knowledge and understanding</i></b></p> <p><b>Technologies and society</b> Social, ethical and sustainability considerations, in the development of technologies and designed solutions, to meet community needs for economic, environmental and social sustainability</p> <p>Development of products, services and environments through the creativity, innovation and enterprise of individuals and groups</p> <p><b>Materials and technologies specialisations</b> The process for the selection and combination of materials, systems, components, tools and equipment</p> <p><b><i>Processes and production skills</i></b></p> <p><b>Investigating and defining</b> Investigate a given need or opportunity for a specific purpose Evaluate and apply a given brief Consider components/resources to develop solutions, identifying constraints</p> <p><b>Designing</b> Design, develop, evaluate and communicate alternative solutions, using appropriate technical terms and technology Produce a simple plan designed to solve a problem, using a sequence of steps</p> <p><b>Producing and implementing</b> Safely apply appropriate techniques to make solutions using a range of components and equipment</p> <p><b>Evaluating</b> Develop contextual criteria independently to assess design processes and solutions</p>

	<p><b>Collaborating and managing</b></p> <p>Work independently, and collaboratively when required, to plan, develop and communicate ideas and information when managing projects</p>
<b>Task preparation</b>	
<b>Prior learning</b>	Students have an understanding of a simple design process, have ICT capabilities and fundamental hand skills of production in wood.
<b>Assessment differentiation</b>	<p>Teachers should differentiate their teaching and assessment to meet the specific learning needs of their students, based on their level of readiness to learn and their need to be challenged.</p> <p>Where appropriate, teachers may either scaffold or extend the scope of the assessment tasks.</p>
<b>Assessment task</b>	
<b>Assessment conditions</b>	Individually complete a design folio and the construction of the product and evaluation sheet.
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Design task template for folio</li> <li>• Relevant theory and skill demonstrations</li> <li>• Selection of available materials, components, tools and equipment</li> </ul>

## Instructions for teacher

1. Open a discussion about:
  - social, ethical and sustainability considerations, in the development of technologies and designed solutions, to meet community needs for economic, environmental and social sustainability
  - development of products, services and environments through the creativity, innovation and enterprise of individuals and groups
  - the process for the selection and combination of materials, systems, components, tools and equipment
  - the design problem is to:  
Design and produce a model spaceship and stand, using timber and other materials, and metal for the stand
2. Below is a page for a mind map. Brainstorming or mind mapping are simple methods for the collection and sorting out of ideas and thoughts.  
Students can create, using computer software or pencil and paper, their own mind map about:
  - different types of spaceships
  - different materials to represent the shapes that represent a stylised model spaceship
3. Instruct students to research, using available research tools, images of ideas students may have about the theme or shapes that could be used for a model spaceship.  
**Design limitations.**
  - Technical knowledge and understanding
  - The space ship will be shaped and formed from:
    - one piece of 12mm plain medium density fibreboard, size 280mm x 200mm, about A4 paper size
    - coloured acrylic plastic, 150mm x 105mm will be used to design and make additional parts for the space ship
    - other materials can be used for small parts of the model
  - Available specialist tools, materials and equipment
  - Teacher-directed and demonstrated:
    - marking, cutting, drilling, and shaping MDF
    - marking, cutting and shaping, edge finishing, polishing and bending acrylic plastic
    - plastics bandsaw, drill, buffing machine, heat strip bender
    - scroll saw, paints or spray cans
    - general workshop tools
  - Design and make a metal stand
    - using sheet metal and wire, you will design and make a metal stand for your spaceship
    - the base can be any shape, made from a 150mm by 150mm square piece of metal
    - the recommended height of the stand is 200mm
  - The space ship will be painted, and then decorated with signage and logos.
4. Describe to students a Statement of Intent.
5. Student should complete a PMI on how the characteristics and properties of their design choices meet their statement of intent.
6. Based on the PMIs, students choose one of the designs to develop, and draw concepts to develop a solution.
7. Discuss with students colours and additional materials they can plan to add to the concepts.
8. Students draw and develop a concept to reproduce on a paper template to transfer to the timber.
9. Discuss with students some different simple metal stands, and how they can be formed.

10. Assist students to list the steps required to build their space ship (demonstrate skills, and instruct students to make notes or give them worksheets during the skill demonstrations).
11. Prepare with the students planned steps of production to collaboratively and safely use tools and equipment in the workshop to produce the space-ships.
12. Demonstrate each required step in the production of the timber parts of a sample project.
13. Provide guidance for students in the marking, cutting and shaping of the timber parts of their solution.
14. Demonstrate each required step in the production of the other parts of a sample project, using different acrylics, metals or textiles.
15. Provide guidance for students in the marking, cutting and shaping of the acrylic or other parts of their solution.
16. Demonstrate each required step in the production of a sample metal stand.
17. Provide guidance for students in the marking, cutting and shaping of the metals for the stand.
18. Provide guidance for students in assembling and finishing their solutions.
19. Students should photograph their finished model space-ship.
20. Discuss the process of evaluation: students write a reflection about how they think their spaceship worked out, referring back to the design brief and statement of intent.

Name: \_\_\_\_\_

Group: \_\_\_\_\_

## Task booklet – Part A

Theme: They came from outer space

The Film Company, *Spaced-out Films*, is making a sci-fi film and requires your school group to come up with ideas for a range of space ships. They require you to design and make a model from 12mm medium density fibreboard (MDF), with added pieces of coloured acrylic plastic to enhance the shape and “realism” of the space-ship. Design and make a metal stand to mount and display the spaceship.

1. Prepare a design folio; start with writing a design brief, for example:

### Design Brief

In this section, write down your design statement.

It might sound like this.

*I will design and make the greatest model of a space ship the world has seen, using 12mm MDF and plastic pieces. It will be sold to Spaced-out Films for its sci-fi film called The Black Sword Ship from the planet Creamed Soup X-3.*

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## Mind map

A large, empty rectangular box with a thin black border, intended for drawing a mind map. The box is oriented vertically and occupies most of the page's width and height.

## Research page

- Examine existing photos: sketch or photocopy existing examples of spacecraft.
- From the mind map, collect and paste 10 images of ideas of your chosen theme.
- Sketch some ideas or photocopy ideas and comment on the possibilities.
- Circle and comment on your favourite ideas.
- Take note of the dimensions of the different parts of spacecraft.

**Statement of intent**

Write a clear description of the project you are going to design and make.

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**PMI**

Reflect on your Statement of Intent using the PMI structure below.

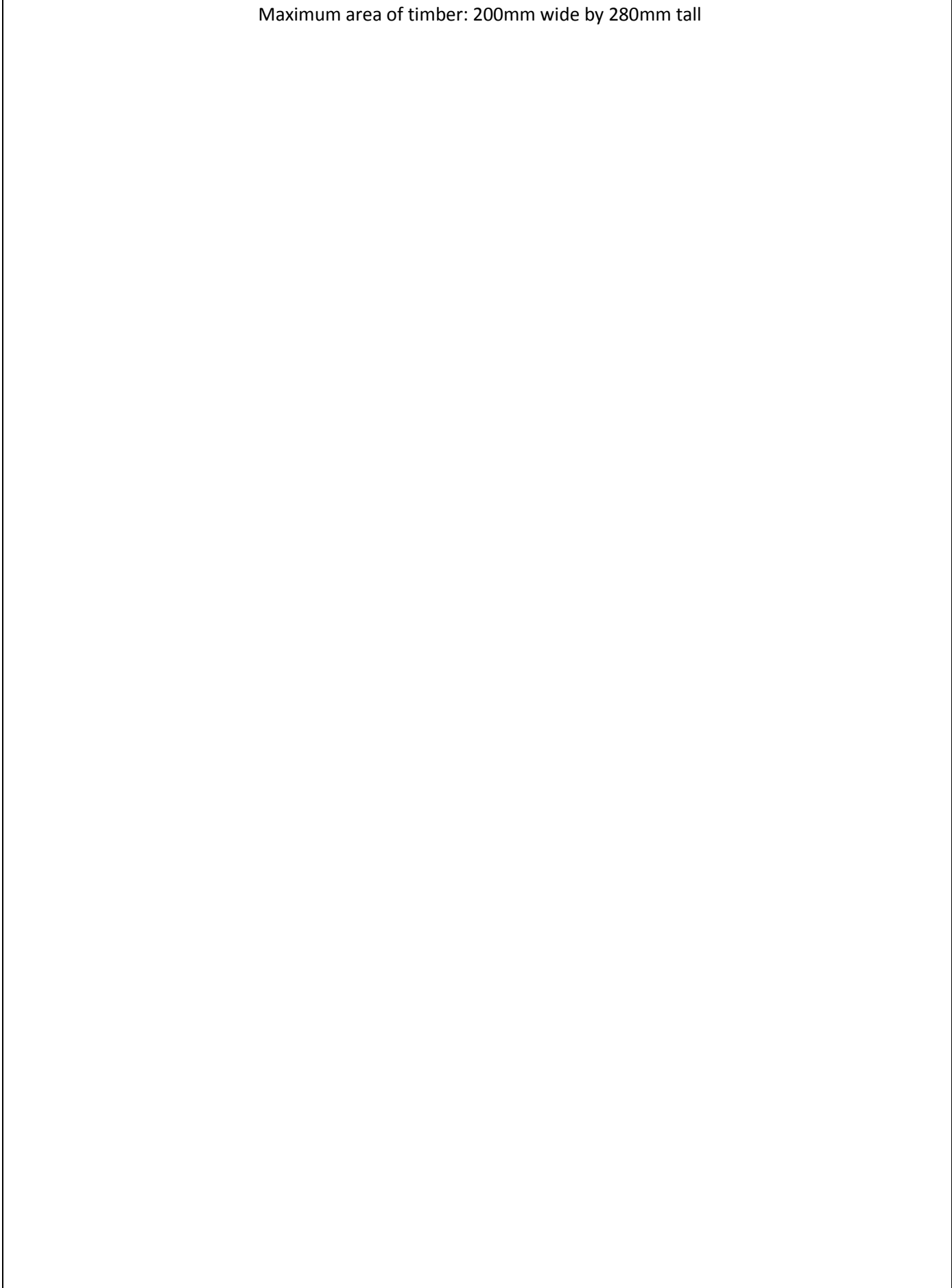
Plus	Minus	Interesting ideas



**Concept pages – drawings of ideas and concepts taken from investigations**

**Drawing the template**

Maximum area of timber: 200mm wide by 280mm tall



**Ideas for additional materials, colours and logos for the spaceship**

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- Discuss the different metal stands, and decide on which one you want to build.

Choice of metal stand

**Notes from Teacher Production skills demonstration**

Making ideas

Take notes on: type of materials, size and colour; marking and cutting tools; forming, bending and shaping tools; joining, fixing tools; finishing procedures.

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### Planning production

List the tools and equipment, and the steps of the process you need to follow to produce your design.

Tools/equipment	Process

### Producing and implementing

Safely apply appropriate techniques to make solutions using a range of components and equipment.

### Collaborating and managing

Work independently, and collaboratively when required, to plan, develop and communicate ideas and information when managing projects.

### Evaluating

Develop contextual criteria independently to assess design processes and solutions.

## Task booklet – Part B

Name: \_\_\_\_\_

Group: \_\_\_\_\_

Write a reflection about how you think your spaceship worked out. Focus on the finished product, its success as well as the areas that could be improved or changed.

Trigger questions

- Did your design turn out as you planned? Explain why or why not? (Consider your sketches and comment on the size, shape, colour, added materials etc.)
- Did your production process use the tools and equipment listed? If not, what changes did you make and why?
- Explain how your product satisfies the design brief and statement of intent. If it did not, what changes did you make and why?

**Include photos of your completed product from Part A here**



**Reflection writing**

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<b>Sample marking key</b>	
<b>Description</b>	<b>Marks</b>
Technologies and Society: Social, ethical and sustainability considerations, in the development of technologies and designed solutions, to meet community needs for economic, environmental and social sustainability Development of products, services and environments through the creativity, innovation and enterprise of individuals and groups	
Demonstrates extensive understanding of the considerations of a variety of technologies, and different products within a theme (shown in the mind map and the variety of notes and images).	5
Demonstrates a high level of understanding of the considerations of some technologies, and different products within a theme (the mind map and the variety of images).	4
Demonstrates a satisfactory level of understanding of technologies and different products (the mind map and the variety of images).	3
Has limited understanding of gathering images and presenting them on a mind map, requires guidance to arrange the mind map.	2
Requires assistance to select images to complete the mind map.	1
<b>Subtotal</b>	<b>5</b>
<b>Description</b>	<b>Marks</b>
Materials and Technologies Specialisations: The process for the selection and combination of materials, systems, components, tools and equipment	
Selects a variety of appropriate materials to design and make a spaceship and justifies materials selected to match their use. Justifies considerations for other components, tools and equipment in detail.	5
Selects materials appropriate to the design and construction of their spaceship and accurately explains choice. Explains considerations of other components, tools and equipment clearly.	4
Selects materials that are appropriate to complete the task. Considers and makes reference to the choice of other components, tools and equipment and gives a simple explanation.	3
Demonstrates limited understanding when selecting appropriate materials for a specific purpose and requires guidance. Requires assistance to describe the other components, tools and equipment.	2
Requires assistance to select appropriate materials to design and make the product.	1
<b>Subtotal</b>	<b>5</b>
<b>Description</b>	<b>Marks</b>
Investigating and defining: Investigate a given need or opportunity for a specific purpose Evaluate and apply a given brief. Consider components/resources to develop solutions, identifying constraints	
Integrates understanding of designing and applies this to the spaceship theme design. Demonstrates thought and insight into the design of the spaceship, considers components and other resources to develop solutions, identifying constraints.	5
Applies learning and consistently demonstrates understanding of design processes. Spaceship investigation reflects appropriate consideration of other materials and resources for the design.	4
Demonstrates a sequence of design process steps, including considering the needs and resources, and provides relevant existing spaceship concepts.	3

Presents minor misunderstandings of the given brief and design process. Considers few materials and components for the spaceship concepts	2
Presents little accuracy or depth of investigation in the task at this stage. Collected ideas may be incomplete and lack any detail.	1
<b>Subtotal</b>	<b>5</b>
<b>Description</b>	<b>Marks</b>
<b>Designing: Design, develop, evaluate and communicate alternative solutions, using appropriate technical terms and technology. Produce a simple plan designed to solve a problem, using a sequence of steps</b>	
Demonstrates extensive knowledge and understanding of design and design choice. Uses a range of appropriate technical terms to explain choices.	5
Demonstrates a high level of competence when choosing a design which is reflected in the drawing of the spaceship. Uses appropriate technical terms to explain choices.	4
Able to accurately draw and label a design for a spaceship. Uses some technical terms to explain choice.	3
Demonstrates limited level of understanding and has inaccuracies in labelled drawing.	2
Demonstrates very limited understanding of designing and does not communicate ideas clearly.	1
<b>Subtotal</b>	<b>5</b>
<b>Description</b>	<b>Marks</b>
<b>Producing and implementing: Safely apply appropriate techniques to make solutions using a range of components and equipment</b>	
Selects materials appropriate to the construction of the spaceship and accurately plans and follows the procedure. Explains safety considerations clearly. Confidently and safely uses a range of components, equipment and techniques to complete the product, explaining any alterations made.	5
Selects construction materials and tools for making the spaceship and follows a planned procedure. Safely uses a range of components, equipment and techniques to complete the product, explaining any changes made.	4
Demonstrates safe processes using a range of components and techniques to complete the product, explaining the some processes. Identifies changes made	3
Requires assistance to produce an end product, changing the design. Attempts to give basic reasons for changes.	2
Attempts to use tools and equipment correctly. Finishes with an end product that does not match the design and provides a limited explanation as to why.	1
<b>Subtotal</b>	<b>5</b>
<b>Description</b>	<b>Marks</b>
<b>Collaborating and managing: Work independently, and collaboratively when required, to plan, develop and communicate ideas and information when managing projects</b>	
Demonstrates consistent management skills and processes. Works independently and co-operatively to develop ideas and plan production. Works collaboratively when required to assist and support others to produce finished products within a timeline.	5
Demonstrates developing management skills. Works co-operatively to develop ideas and plan production. Works collaboratively when required to produce products on time.	4
Works co-operatively to develop ideas and plan production. Works collaboratively in the workshop to finish a product.	3
Works co-operatively in the workshop to produce a product.	2
Demonstrates little collaboration, and requires assistance to work towards an end product.	1



<b>Subtotal</b>	<b>5</b>
<b>Description</b>	<b>Marks</b>
Evaluating: Develop contextual criteria independently to assess design processes and solutions	
Comprehensively reflects on design criteria and how they compare with the end product, with accurate explanations about production, including any alterations and changes to plans.	5
Understands and describes how the spaceship model matches the design criteria, including changes made to design and/or production.	4
Explains the completed product. Lists any changes made.	3
Provides a brief description of the end product, which may not match design. Lists some basic reasons for differences.	2
Limited explanation as to why end product does not match the design.	1
<b>Subtotal</b>	<b>5</b>